

AMENDMENTS TO THE CLAIMS

The following listing of claims replaces all prior versions and listings of claims in the application.

Listing of Claims:

1. (Currently Amended) ~~Orbital~~ An orbital welding device for mobile use for joining a first pipe end and a second pipe end along a circumferential joint by means of at least one weld seam for producing a pipeline to be laid on land comprising:
 - a guide ring oriented relative to the first pipe end and the circumferential joint;
 - an orbital carriage displaceably guided at least along a section of the guide ring;
 - a feed device ~~for moving~~ configured to move the orbital carriage under motor power along the guide ring;
 - a welding head which is arranged on the orbital carriage in alignment with the circumferential joint so that, by moving the orbital carriage, the weld seam is produced at least along a section of the circumferential joint;
 - a connecting line;
 - a mobile welding device which is positioned a distance away from the orbital carriage and is connected via the connecting line to the welding head and provides the power required for producing the weld seam;
 - an orbital position sensor ~~for detecting the~~ configured to detect an orbital position of the orbital carriage; and
 - a first process parameter control ~~which is connected to the orbital position sensor and at least to the high power laser beam source in such a way that laser radiation~~

~~parameters are automatically adapted as a function of the orbital position of the orbital carriage;~~

wherein

- the welding device is a high-power laser beam source, by means of which a laser beam is produced,
- the connecting line is a waveguide ~~for guiding~~ configured to guide the laser beam to the orbital carriage, [[and]]
- the welding head is a laser welding head ~~for directing~~ configured to direct the laser beam into a laser welding zone and for the consequent production of the weld seam, and
- the first process parameter control is connected to the orbital position sensor and at least to the high-power laser beam source in such a way that laser radiation parameters are automatically adapted as a function of the orbital position of the orbital carriage.

2. (Currently Amended) ~~Orbital~~ The orbital welding device according to claim 1, wherein
 - the guide ring is designed so as to be capable of being arranged on the outer surface of the first pipe end, and
 - the weld seam is in the form of an outer weld seam.
3. (Currently Amended) ~~Orbital~~ The orbital welding device according to claim 1, further comprising:

- a process gas nozzle arranged indirectly or directly on the orbital carriage and ~~intended for supplying~~ configured to supply process gas to the region of the laser welding zone;
 - a process gas line; and
 - a process gas store which is a distance away from the orbital carriage and is connected via the process gas line to the process gas nozzle for the supply of process gas.
4. (Currently Amended) ~~Orbital~~ The orbital welding device according to claim 1, further comprising:
- a wire nozzle arranged indirectly or directly on the orbital carriage and ~~intended for supplying~~ configured to supply a wire into the laser welding zone;
 - a wire feed line; and
 - a wire feed unit which is a distance away from the orbital carriage and is connected via the wire feed line to the wire nozzle for supplying wire.
5. (Currently Amended) ~~Orbital~~ The orbital welding device according to claim 4, further comprising a wire heating unit located upstream of the wire nozzle and adapted for heating the wire.

6. (Currently Amended) ~~Orbital~~ An orbital welding device for mobile use for joining a first pipe end and a second pipe end along a circumferential joint by means of at least one weld seam, ~~in particular for producing a pipeline to be laid on land~~ the orbital welding device comprising:

- a guide ring oriented relative to the first pipe end and the circumferential joint;
- an orbital carriage displaceably guided at least along a section of the guide ring;
- a feed device ~~for moving~~ configured to move the orbital carriage under motor power along the guide ring;
- a welding head which is arranged on the orbital carriage in alignment with the circumferential joint so that, by moving the orbital carriage, the weld seam is produced at least along a section of the circumferential joint;
- a connecting line; and
- a mobile welding device which is a distance away from the orbital carriage and is connected via the connecting line to the welding head and provides the power required for producing the weld seam;

wherein

- the welding device is a high-power laser beam source, by means of which a laser beam is produced;
- the connecting line is a waveguide ~~for guiding~~ configured to guide the laser beam to the orbital carriage;
- the welding head is a laser welding head ~~for directing~~ configured to direct the laser beam into a laser welding zone and for the consequent production of the weld seam;

- a gas metal arc welding (GMAW) head is arranged indirectly or directly on the orbital carriage;
 - the connecting line includes a GMAW power line, a GMAW process gas line, and a GMAW wire feed line;
 - a GMAW power source is a distance away from the orbital carriage and is connected via the GMAW power line to the GMAW head for forming ~~[[the]]~~ a GMAW arc;
 - a GMAW process gas store is a distance away from the orbital carriage and is connected via the GMAW process gas line to the GMAW head for supplying the GMAW process gas; and
 - ~~a GMAW wire feed unit is a distance away from the orbital carriage and is connected via the GMAW wire feed line to the GMAW head for supplying the GMAW wire~~
welding by the laser beam is combined with welding by the GMAW head in such a way that the laser beam and the GMAW arc weld simultaneously during movement of the orbital carriage.
7. (Currently Amended) ~~Orbital~~ The orbital welding device according to claim 6, wherein the GMAW head is arranged indirectly or directly on the orbital carriage in such a way that the laser beam and the GMAW arc cooperate in the laser welding zone.
8. (Currently Amended) ~~Orbital~~ The orbital welding device according to claim 6, wherein the GMAW head is arranged indirectly or directly on the orbital carriage ~~[[the]]~~ in such a way that the laser beam ~~[[the]]~~ and the MSG arc act in separate process zones.

9. (Currently Amended) ~~Orbital~~ The orbital welding device according to claim 6, wherein an orbital position sensor ~~for detecting~~ configured to detect the orbital position of the orbital carriage is connected to a first process parameter control which automatically varies GMAW arc parameters and the orbital carriage's speed of advance ~~of the orbital carriage~~ as a function of the orbital position of the orbital carriage.
10. (Currently Amended) ~~Orbital~~ The orbital welding device according to claim 1, wherein
- a seam tracking sensor is arranged indirectly or directly on the orbital carriage in such a way that the position of the circumferential joint relative to the intended laser welding zone is detected;
 - adjusting means orients the laser beam relative to the circumferential joint; and
 - a position control is connected to the seam tracking sensor and the adjusting means in such a way that the orientation of the laser beam is automatically regulated as a function of the detected position of the circumferential joint.
11. (Currently Amended) ~~Orbital~~ The orbital welding device according to claim 6, further comprising:
- a process sensor arranged indirectly or directly on the orbital carriage in such a way that electromagnetic radiation from the laser welding zone is detected; and
 - a second process parameter control connected to the process sensor and at least the high-power laser beam source in such a way that at least GMAW arc parameters, the speed of advance of the orbital carriage and the orientation of the laser beam are automatically adapted as a function of the detected radiation.

12. (Currently Amended) ~~Orbital~~ The orbital welding device according to claim 1, further comprising:
 - an optical seam quality sensor arranged indirectly or directly on the orbital carriage, tracking the laser welding zone and adapted for making optical recordings of the weld seam produced; and
 - logging means which are connected to the seam quality sensor for storage and optical playback of the recordings of the weld seam produced.
13. (Currently Amended) ~~Orbital~~ The orbital welding device according to claim 12, further comprising image processing means which is connected to the logging means in such a way that the recordings of the weld seam produced is electronically evaluated and an evaluation signal which is associated with the quality of the weld seam is output.
14. (Currently Amended) ~~Orbital~~ The orbital welding device according to claim 13, further comprising a third process parameter control which is connected at least to the image processing means and the high-power laser beam source in such a way that the speed of advance of the orbital carriage and the orientation of the laser beam are automatically adapted as a function of the evaluation signal.
15. (Currently Amended) ~~Orbital~~ The orbital welding device according to claim 1, wherein a transport vehicle is moved longitudinally under motor power outside the first pipe and the second pipe and on which at least

- the high-power laser beam source,
 - a generator at least ~~for generating~~ configured to generate the power required for operating the high-power laser beam source and
 - a cooling system, coordinated at least with the high-power laser beam source,
- are arranged so that the orbital welding device ~~can be operated~~ is operable in a ~~substantially~~ stand-alone mobile manner.

16. (Currently Amended) ~~Transport~~ A transport vehicle of ~~[[an]]~~ the orbital welding device according to claim ~~[[15]]~~ 1, wherein the transport vehicle is moved longitudinally under motor power outside the first pipe and the second pipe and wherein:

- the high-power laser beam source,
 - ~~[[the]]~~ a generator at least ~~for generating~~ configured to generate the power required for operating the high-power laser beam source,
 - ~~[[the]]~~ a cooling system coordinated at least with the high-power laser beam source,
 - a process gas store,
 - a wire feed unit,
 - a GMAW power source,
 - a GMAW process gas store and
 - a GMAW wire feed unit
- are arranged on the transport vehicle.

17. (Canceled)

18. (Canceled)
19. (Currently Amended) ~~Orbital~~ The orbital welding device according to claim 6, wherein the orbital welding device is adapted to perform the welding of the pipe studs by means of only one orbit pass.
20. (Currently Amended) ~~Orbital~~ The orbital welding device according to claim 1, wherein the high-power laser beam source is a high-power fibre laser beam source.
21. (Currently Amended) ~~Orbital~~ The orbital welding device according to claim 6, wherein
- a seam tracking sensor is arranged indirectly or directly on the orbital carriage in such a way that the position of the circumferential joint relative to the intended laser welding zone is detected;
 - adjusting means orients the laser relative to the circumferential joint; and
 - a position control is connected to the seam tracking sensor and the adjusting means in such a way that the orientation of the laser beam is automatically regulated as a function of the detected position of the circumferential joint.
22. (Currently Amended) ~~Orbital~~ The orbital welding device according to claim 6, further comprising:
- an optical seam quality sensor arranged indirectly or directly on the orbital carriage, tracking the laser welding zone and adapted for making optical recordings of the weld seam produced; and

- logging means which are connected to the seam quality sensor for storage and optical playback of the recordings of the weld seam produced.
23. (Currently Amended) ~~Orbital~~ The orbital welding device according to claim 22, further comprising image processing means which is connected to the logging means in such a way that the recordings of the weld seam produced is electronically evaluated and an evaluation signal which is associated with the quality of the weld seam is output.
24. (Currently Amended) ~~Orbital~~ The orbital welding device according to claim 23, further comprising a third process parameter control which is connected at least to the image processing means and the high-power laser beam source in such a way that the speed of advance of the orbital carriage and the orientation of the laser beam are automatically adapted as a function of the evaluation signal.
25. (Currently Amended) ~~Orbital~~ The orbital welding device according to claim 6, wherein a transport vehicle is moved longitudinally under motor power outside the first pipe and the second pipe and on which at least
- the high-power laser beam source,
 - a generator at least ~~for generating~~ configured to generate the power required for operating the high-power laser beam source and
 - a cooling system, coordinated at least with the high-power laser beam source,
- are arranged so that the orbital welding device ~~can be operated~~ is operable in a ~~substantially~~ stand-alone mobile manner.

26. (Currently Amended) ~~Transport~~ A transport vehicle of an orbital welding device according to claim ~~[[25]]~~ 6, wherein the transport vehicle is moved longitudinally under motor power outside the first pipe and the second pipe and wherein:
- the high-power laser beam source,
 - ~~[[the]]~~ a generator at least ~~for generating~~ configured to generate the power required for operating the high-power laser beam source,
 - ~~[[the]]~~ a cooling system coordinated at least with the high-power laser beam source,
 - a process gas store,
 - a wire feed unit,
 - the GMAW power source,
 - the GMAW process gas store and
 - the GMAW wire feed unit
- are arranged on the transport vehicle.
27. (Currently Amended) ~~Orbital~~ The orbital welding device according to claim 6, wherein the high-power laser beam source is a high-power fibre laser beam source.